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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,373	10/31/2000	Kouji Shiraishi	P100021-00030	7821

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EXAMINER

VANOY, TIMOTHY C

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 10/16/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/699,373

Applicant(s)

SHIRAHASHI et al.

Examiner

VANDY

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

date-stamped Aug. 8 2002

☒ Responsive to communication(s) filed on _____

☒ This action is **FINAL**.

- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-4 is/are pending in the application.

Of the above claim(s) 3 AND 4 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-2 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 6
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

Art Unit: 1754

DETAILED ACTION

Election/Restrictions

Newly submitted claims 3 and 4 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 3 and 4 are directed to an apparatus, which can be used for another and materially different process from that set forth in Applicants' claims 1 and 2, such as a process for the removal of ammonia out of a gas. Because these inventions are distinct for the reasons given above and these inventions have acquired a separate status in the art as shown by their different classification; these inventions have acquired a separate status in the art as shown by their recognized divergent subject matter, and the search required for the invention of claims 1 and 2 is not required for the invention of claims 3 and 4 (and vice-versa), restriction for examination purposes as indicated is proper.

Since the Applicants have received an Office Action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 3 and 4 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Art Unit: 1754

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 2 are again rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-290,643 A in view of pgs. 14-13 and 18-31 in the Chemical Engineers' Handbook (5th ed.) edited by Perry et al.

The English abstract of JP-643 discloses a method for removing contaminants out of a gas by injecting the contaminated gas into a gas-liquid scrub tower where it counter-currently contacts with seawater and discharging the scrubbed gas out of the gas-liquid contact tower and charging the resulting (contaminant-containing) seawater into an oxidation tank where both NaOH and air are injected into the contaminant-containing seawater (note that Fig. 3 appears to illustrate the addition of NaOH into this oxidation tank 2). It appears that untreated, "raw" seawater (i. e. "noncontact seawater") is then mixed in with seawater that has been previously treated with air and NaOH, and this mixture of seawaters is then discharged.

Note that the 1st paragraph in the text of JP-643 appears to mention the same 500 mm set forth in the 4th line in Applicants' claim 2 as well as an Fc ratio of 0.3 to 0.6.

Note that parag. no [0003] in the text of JP-643 appears to mention the same L value ranging from 10^4 to 25×10^4 ; the same L/G ratio being 3.6 set forth in Applicants' claim 2;

Note that the top half of pg. 2 in JP-643 reports the same ρ_L (kg/m^3) = 1030 and the same ρ_G/ρ_L ratio being 0.838×10^{-3} ; the same U_{gm} being $49.14 F_c^{0.7} (\rho_G/\rho_L \times 10^{-3})^{-0.5} (L/G)^{-1/3} (g \cdot L)^{-1/2}$ and L being $(2\sigma/\rho_L \cdot g)^{-1/2}$ set forth in Applicants' claim 2.

Applicants' claim 2 sets forth that U_g may be a value ranging from 0 to 2 times U_{gm} (m/sec), however, while this equation does not appear to be expressly recited in

Art Unit: 1754

the text of JP-643, Fig. 1 in JP-643 does illustrate U_g values ranging from as low as 1.5 to as high as 10 and also appears to illustrate U_{gm} values of just under 2 to just over 4 (please see the curve labeled U_{gm}) – thus, the actual U_g and U_{gm} values contemplated by the scope of Applicants' claim 2 would not seem to be indistinct from the actual values embraced in the process of JP-643.

The difference between Applicants' claims 1 and 2 and JP-643 is that Applicants' claim 1 sets forth that the tower is a packed tower and Applicants' claim 2 sets forth that the packing height in the tower ranges from 0.5 to 4 meters (that is, the Applicants use a *packed* tower having a diameter that is at least 500 mm (1.64 feet)), while JP-643 uses *plate* towers.

Pg. 14-13 in the Chemical Engineers' Handbook (5th ed.) reports (under the paragraph header titled "Packed Towers") that the advantage for small (packed) columns having a diameter that is less than about 2 feet is that they will usually be cheaper than plate towers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in JP-643 *by substituting* a packed gas-liquid scrubbing tower *in lieu of* one or more of the perforated plates in the plate gas-liquid scrubbing tower, in the manner required by Applicants' claims 1 and 2, *because* pg. 14-13 in the Chemical Engineers' Handbook fairly teaches that it is *less expensive* to use packed towers having a diameter of less than 2 feet (which is not distinct from the diameter of at least 500 mm. reported in Applicants' claim 2 and also in the first paragraph in the text of JP-643) as compared to using plate towers and also

Art Unit: 1754

teaches that pressure drops are lower in packed towers than in plate towers. By substituting packing material in lieu of one or more plates in the plate towers described in JP-643, one would expect to save money and reduce pressure drop problems as fairly suggested on pg. 14-13 in the Chemical Engineers' Handbook.

The difference between the Applicants' claims and JP-643 is that Applicants' claim 2 defines the height of the packing in the column to range from 0.5 to 4 meters (1.64 to 13.12 feet).

In the discussion of packed columns on 18-31 in the Chemical Engineers' Handbook, mention is made of packing heights (in packed towers) as low as 4 feet to as high as 35 feet, therefore it is submitted to have been obvious to one of ordinary skill in the art at the time the invention was made *to describe* the height of the packing in the column to range from 0.5 to 4 meters (1.64 to 13.12 feet), in the manner called for in Applicants' claim 2, *because* the discussion of packing heights set forth on pg. 18-31 in the Chemical Engineers' Handbook fairly suggests that the claimed heights of 0.5 to 4 meters (1.64 to 13.12 feet) are merely representative and typical of the art, consistent with the conclusions of the *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976) court decision set forth in section 2144.05(I) in the MPEP (8th ed.). It is obvious to use such process parameters that are conventionally and routinely used in this art.

Response to Arguments

The Applicants' arguments submitted in their Amendment date-stamped Aug. 8, 2002 (paper no. 5) have been fully considered but they are not persuasive.

Art Unit: 1754

a) *The Applicants argue that, unlike the prior art, the present invention teaches the use of a gas-liquid contact apparatus composed of an absorption column provided with perforated plates and at least one type of filler. The absorption column has a diameter of at least 500 mm.; is provided with a perforated plate; has a free space ratio of F_c of 0.25 to 0.5, and is packed with filler to a height of 0.5 to 4 meters.*

The only perceptible difference between the Applicants' claims and JP 11-290,643 is that Applicants' claim 1 step (a) requires the limitation: "packed with at least one type of fillers", however it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process described in JP-643 *by substituting* packing material *in lieu of* one or more perforated plates in the plate gas-liquid scrubbing tower, in the manner required by Applicants' claims 1 and 2, *because* pg. 14-13 in the Chemical Engineers' Handbook fairly teaches that it is *less expensive* to use packed towers having a diameter of less than 2 feet (which is not distinct from the diameter of at least 500 mm. reported in Applicants' claim 2 and also in the first paragraph in the text of JP-643) as compared to using plate towers and also teaches that pressure drops are lower in packed towers than in plate towers. By substituting packing material in lieu of one or more plates in the plate towers described in JP-643, one would expect to save money and reduce pressure drop problems as fairly suggested on pg. 14-13 in the Chemical Engineers' Handbook.

b) *The Applicants argue that the result of their invention is that exhaust gas can be effectively treated with seawater, and the resultant waste seawater can be discharged*

Art Unit: 1754

into the sea only by the oxidation of air and the mixing with raw seawater. This is not taught or suggested by the prior art references.

Nor is this description of the Applicants' invention set forth in their claims *in as much as* there is nothing in the Applicants' claims requiring that the waste seawater be mixed with raw seawater before being discharged into the sea, in the manner that the Applicants' argument seems to suggest.

c) *The Applicants argue that JP-643 does not teach or suggest that contact seawater (i. e. waste seawater) can be discharged back into the sea without using chemicals, such as NaOH.*

Nor is this addition of chemicals into the waste seawater excluded by the scope of the Applicants' claims.

d) *The Applicants argue that JP-643 does not teach or suggest the second contact with raw seawater after oxidation - this is a prime feature of the present invention and an improvement over JP-643.*

The broadest interpretation of Applicants' claim 1 step (c) does not distinguish this step from the step of merely discharging the oxidized, waste seawater of JP-643 back into the sea. There is nothing in the Applicants' claims requiring that an oxidized *mixture* of waste seawater and raw seawater be discharged into the sea. In fact, Applicants' claim 1 step (c) does not differentiate the "mixing" step from the "discharging" step. The Applicants' claims only require that "oxidized seawater" be discharged, which is not distinct from JP-643. From the disclosure set forth in col. 5 lns. 1-4 and col. 6 lns. 50-51 in U. S. Pat. 5,690,899, it appears that the argued second

Art Unit: 1754

contact (i. e. second addition) of seawater and the argued addition of NaOH to the waste seawater described in JP-643 are known in this art to be obvious functionally equivalent means for the same purpose of adjusting the pH of the waste seawater before discharging it back into the sea.

e) *The Applicants argue that it appears that there was confusion in the Office Action regarding diameter and packing height.*

There is no confusion in the 103 rejection regarding column heights and packing heights, or column diameters and packing heights. The mention of packing heights in the range of 4 feet to 35 feet on pg. 18-31 in the Chemical Engineers' Handbook is evidence that the claimed packing heights of 1.64 feet to 13.12 feet (0.5 to 4 meters) is merely representative and typical of the art. The column diameter of at least 500 mm. set forth in Applicants' claim 2 is not distinct from the column diameters that are less than 2 feet described on pg. 14-13 in the Chemical Engineers' handbook.

The Applicants' request for a telephone interview has been noted, but is submitted to be premature since the Applicants would not have the advantage of considering the Examiner's rebuttal to the arguments prior to the interview.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1754

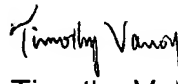
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

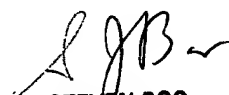
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached at phone no. 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv
September 12, 2002


Timothy Vanoy
Patent Examiner

Art Unit 1754


STEVEN BOS
PRIMARY EXAMINER
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PRIMARY EXAMINER
GROUP 1100